



# PHYS1510

## Engineering Physics

Session 1, In person-scheduled-weekday, North Ryde 2022

*School of Mathematical and Physical Sciences*

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### Disclaimer

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## General Information

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Credit points

10

Prerequisites

(HSC Advanced Mathematics Band 4 and above or Extension 1 Band E2 and above or Extension 2) or MATH1000 or MATH130 or WFMA003 or WFMA0003

Corequisites

Co-badged status

### Unit description

The design and development of new technologies is governed and constrained by the fundamental laws of nature, as described by the principles and practice of physics. The topics studied in this unit are illustrated with everyday examples to provide an overview of physics for students studying engineering disciplines. Laboratory sessions enable physics concepts to be explored in a practical way, and build skills in experimentation, measurement, data collection and analysis.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

**ULO1:** explain foundational physics concepts in terms of their underlying physical principles and describe them in terms of concise mathematical models.

**ULO2:** analyse a real-world problem, break the problem into component parts relating to different areas of physics, identify known quantities and apply mathematical models to arrive at a numerical value for an unknown quantity, and interpret how the numerical results relate to the physical world.

**ULO3:** perform physical measurements, record experimental data, display data graphically, analyse data, and draw written conclusions in a clear, concise, and systematic manner.

**ULO4:** identify, record and explain sources of uncertainty in physical measurements; and undertake appropriate uncertainty analysis of results, including statistical analysis.

**ULO5:** demonstrate foundational learning skills including active engagement in your learning process.

**ULO6:** work collaboratively with peers.

## General Assessment Information

### Laboratory work See the lab schedule on iLearn for dates Weighting: 25%

Satisfactory completion of laboratories is a **hurdle requirement**. You **must** attend **all ten** laboratory sessions. The **first lab session is in week 1** and includes work health and safety information. Students may also be assigned to lab groups, lab books will be handed out, and computer access will be checked. It needs to be attended by all students regardless of whether this is their first Physics unit or not. It will be a little bit shorter than the other sessions, but attendance is absolutely mandatory – you can't do subsequent lab sessions if you don't attend

the introductory one. The **next 9 lab sessions** involve experimental work and will be assessed. **You must obtain a mark of at least 40% for each of the laboratory sessions in order to pass the unit.**

**Preparation is required** for each of the lab sessions 2-10. You will find the **Prelab activities** in the Laboratory Resources section of iLearn. Your prelab work will account for some of the marks for each laboratory session.

**If you miss a session or fail to achieve at least 40% for any lab session**, you must complete a **“Request to schedule a Catch-up laboratory session”** form, which can be found on iLearn. See iLearn for full details about catch up classes and when they are scheduled. **No more than 3 catch ups are allowed for missed labs/lab hurdles**, except where Special Consideration has been approved. If you fail to attend the catch-up class you are booked into, then that will count as another missed lab.

## Quizzes Weighting: 25%

**This is a hurdle assessment task** (see [assessment policy](#) for more information on hurdle assessment tasks)

Short quizzes associated with weekly SGTAs. You must complete at least 8 weekly Quizzes offered during the semester. We will include the best 10 marks from the 12 weekly quizzes.

## Mid Semester Exam Weighting 10%

This will be held during SGTAs in week 8. It will cover material from weeks 1-7 of semester. It is not a hurdle assessment.

## Final examination Weighting: 40%

**This is a hurdle assessment task** (see [assessment policy](#) for more information on hurdle assessment tasks)

The final examination is a hurdle requirement. You must obtain a mark of at least 40% in the final exam to be eligible to pass the unit. If your mark in the final examination is between 30% and 39% inclusive, you may be given a second and final chance to attain the required level of performance; the mark awarded for the second exam towards your final unit mark will be capped at 40%, and you will be allowed to sit the second exam only if this mark would be sufficient to pass the unit overall.

Examination in the university exam period, covering all the content from the unit.

**NOTE: If you miss an assessment, you must apply for Special Consideration through [ask.mq](#)**

## Late Assessment Submission

Late assessments are not accepted in this unit unless a Special Consideration has been submitted and approved.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Midsession exam</u>	10%	No	Week 8 during STGA classes
<u>Lab book</u>	25%	Yes	Weekly
<u>Final examination</u>	40%	Yes	Examination Period
<u>Quizzes</u>	25%	Yes	Weekly

### Midsession exam

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 8 during STGA classes**

Weighting: **10%**

Short exam on the content from the first half of the unit, taken during an SGTA session.

On successful completion you will be able to:

- explain foundational physics concepts in terms of their underlying physical principles and describe them in terms of concise mathematical models.
- analyse a real-world problem, break the problem into component parts relating to different areas of physics, identify known quantities and apply mathematical models to arrive at a numerical value for an unknown quantity, and interpret how the numerical results relate to the physical world.

### Lab book

Assessment Type <sup>1</sup>: Lab book

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Weekly**

Weighting: **25%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

Assessment of in-lab record of experimental activities, including any pre-lab work.

On successful completion you will be able to:

- perform physical measurements, record experimental data, display data graphically, analyse data, and draw written conclusions in a clear, concise, and systematic manner.
- identify, record and explain sources of uncertainty in physical measurements; and undertake appropriate uncertainty analysis of results, including statistical analysis.
- work collaboratively with peers.

## Final examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Examination Period**

Weighting: **40%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

Examination in the university exam period, covering all the content from the unit.

On successful completion you will be able to:

- explain foundational physics concepts in terms of their underlying physical principles and describe them in terms of concise mathematical models.
- analyse a real-world problem, break the problem into component parts relating to different areas of physics, identify known quantities and apply mathematical models to arrive at a numerical value for an unknown quantity, and interpret how the numerical results relate to the physical world.

## Quizzes

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Weekly**

Weighting: **25%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle**

## assessment tasks)

Short quizzes taken during the weekly SGTAs.

On successful completion you will be able to:

- explain foundational physics concepts in terms of their underlying physical principles and describe them in terms of concise mathematical models.
- analyse a real-world problem, break the problem into component parts relating to different areas of physics, identify known quantities and apply mathematical models to arrive at a numerical value for an unknown quantity, and interpret how the numerical results relate to the physical world.
- perform physical measurements, record experimental data, display data graphically, analyse data, and draw written conclusions in a clear, concise, and systematic manner.
- demonstrate foundational learning skills including active engagement in your learning process.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

**Off-shore students must email the convenor as soon as possible to discuss study options**

We will offer lectures, laboratories and SGTAs in person, with related assessments marked regularly. Problem-solving is a key skill to develop in this subject, supported by lecture content, textbook readings, and examples of worked solutions to tutorial questions. This will be assessed through regular quizzes, mid semester and final examination.

### Laboratory Sessions

The laboratory component is an essential component of your studies and it contributes an appreciable fraction of your final assessment. You will be introduced to some of the basic skills and techniques required of practising physicists, scientists and engineers. **You will be issued with a Laboratory Notebook**, provided with instructional material in the form of **Laboratory Notes** which can be found in the Laboratory Resources section of iLearn, and

assisted in the laboratory by a team of demonstrators. For each laboratory session, except in week 1, you are required to complete some preparatory work (**Pre-Lab**) before attending your nominated Lab session. To figure out which Prelab to do, please consult the **Laboratory Schedule** on iLearn.

Location: There are two laboratories used for 1st year physics they are both in **14 SCO (formerly E7B)**:

**Room 114** (Ground floor at the North-East corner of building)

**Room 254** (First floor, north-facing side of the atrium)

Please check your timetable to see where your lab class will take place.

### **Problem-solving classes**

SGTAs will be held every week, with assigned problems posted online. Please check your timetable to see where and when your class will be held. Students will work on solving the problems in the class and tutors will be available to advise.

Quizzes will be assigned each week, and marks recorded.

## **Policies and Procedures**

Macquarie University policies and procedures are accessible from **Policy Central** (<https://policies.mq.edu.au>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit **Student Policies** (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit **Policy Central** (<https://policies.mq.edu.au>) and use the [search tool](#).

## **Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>



## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](mailto:ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault

- [Social support including information about finances, tenancy and legal issues](#)

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes from Previous Offering

We will offer quizzes during SGTAs, and we will include a mid semester exam instead of assignments.

## Changes since First Published

Date	Description
11/07/2022	Late assessment submission information has been added.